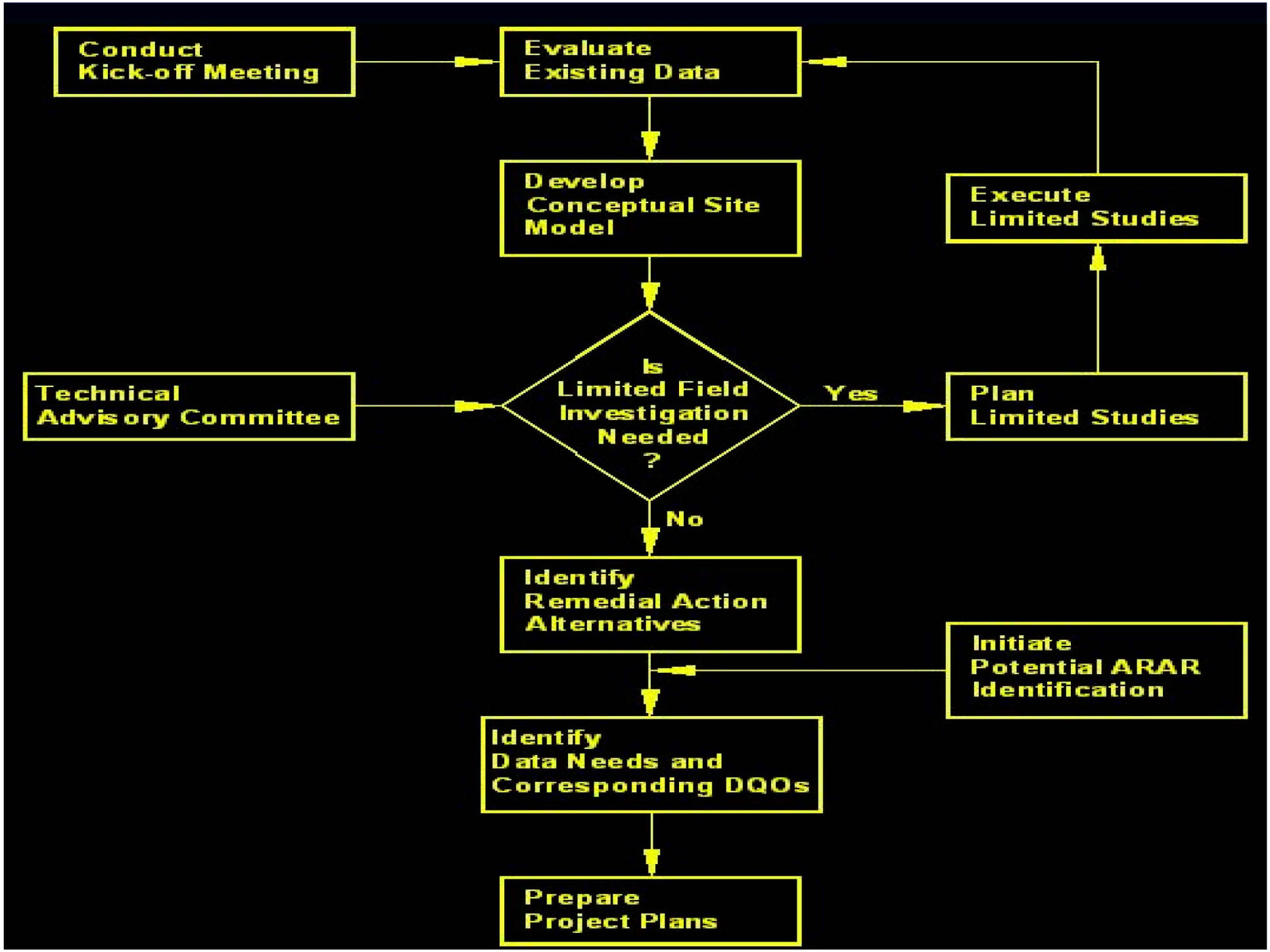
Falcon Refinery

aka National Oil Recovery Corporation

- RI/FS Scoping Meeting
  - July 7, 2004

Kickoff Meeting

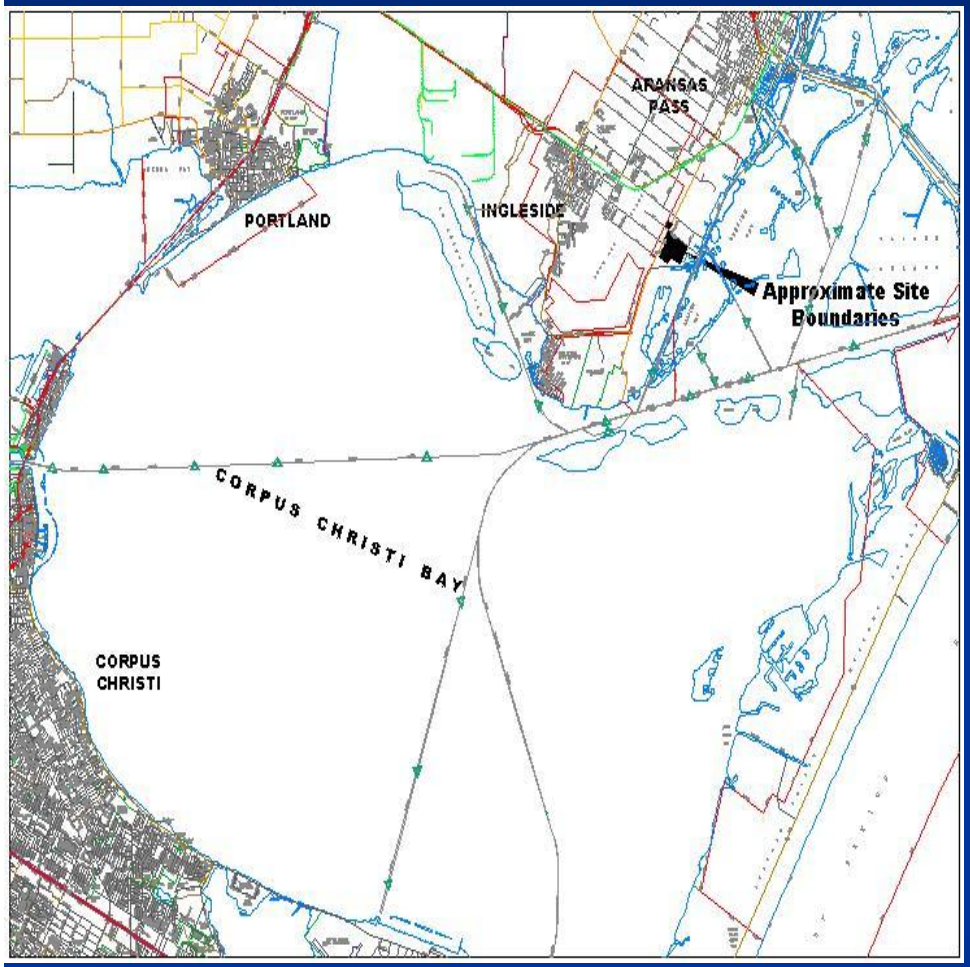
- Removal Action Activities
  - Asbestos inspection
  - Determine volume and composition of liquid and sludge
  - Decontamination and removal of vessels
  - Removal and disposal or treatment of grossly contaminated soil
- Discuss roles and lines of communication


Conduct Kick-off Meeting
Evaluate Existing Data
Develop Conceptual Site Model
Execute Limited Studies
Technical Advisory Committee
Is Limited Field Investigation Needed ?
Yes
Plan Limited Studies
No
Identify Remedial Action Alternatives
Initiate Potential ARAR Identification
Identify Data Needs and Corresponding DQOs
Prepare Project Plans

Evaluation of Existing Data

- Site Characterization
- Risk Definition
- Viable Remedial Action Alternatives
- Applicable or Relevant and Appropriate Requirements (ARARs)
- Treatability Study Analysis

Site Characterization



Site Characterization (cont.)

- The population of the city of Ingleside is approximately 9,388

- Falcon Refinery is an inactive oil refinery. The site is located in the San Antonio- Nueces Coastal Basin, adjacent to Redfish Bay, which connects Corpus Christi Bay to the Gulf of Mexico. Surface water drainage from the site enters the wetlands along the southeastern section of the abandoned refinery.

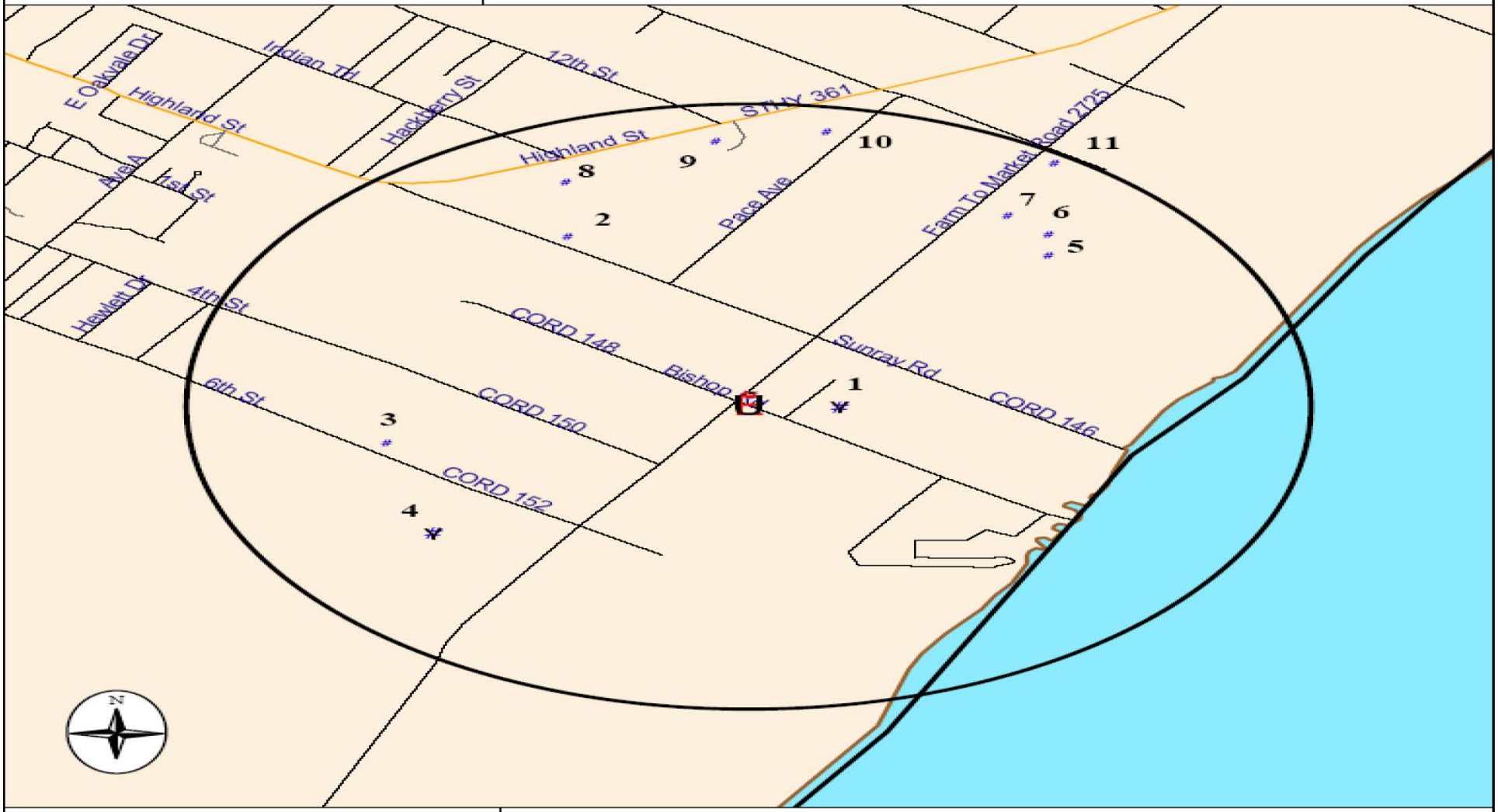
Regional Geology and Hydrogeology

- Surface deposits consist of Quaternary Alluvium, which is comprised of clay, silt and sand of varying grain size.
- Due to inadequate supply and the poor quality of the groundwater, Ingleside use surface water from Lake Corpus Christi.

Banks Information Solutions, Inc.

Water Well Report™

Map of Wells within One Mile



Subject Site
Ground Water Wells (Cluster)
Ground Water Well
Airport
Hoepital
Highway
Primary road
Secondary and connecting road
Local road
Access road
Water body
Park
State

0 0.25 0.5 0.75 1 Miles

Banks Information Solutions, Inc.
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700 N. Lamar, Suite 200 Austin, Texas 78703
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June 30, 2004

Site Characterization (cont.)

- The site is bordered by wetlands to the northeast and southeast, residential areas to the north and southwest, an abandoned refinery to the northwest, and a construction company to the southwest.

Surface Water Pathway

- **Average annual rainfall is 35.0 inches.**
- **2-year, 24-hour rainfall is 4.5 inches**
- **Site is within a 100-year floodplain**
- **Redfish Bay Segment 2483**
  - Effluent limited, good quality water, permitted discharges include two domestic and five industrial
- **Aransas Bay Segment 2471 (Enclosed Bay)**
  - Connects to Ayres Bay, Copano Bay and Redfish Bay

Surface Water Pathway (cont.)

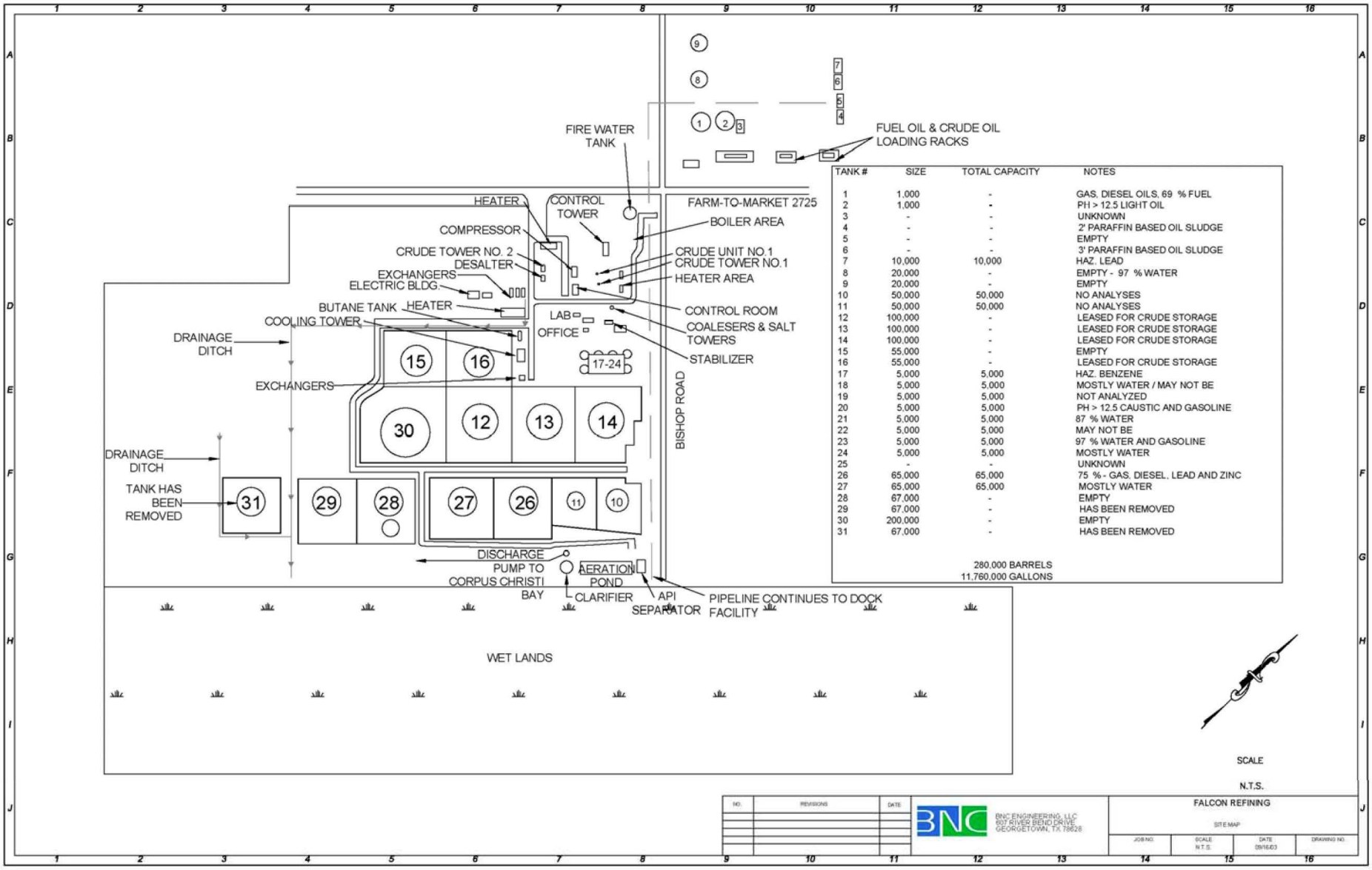
- **Corpus Christi Bay Segment 2481**
  - Uses include contact recreation, exceptional aquatic life and oyster waters.
  - Receives fresh water from the Nueces River and Lake Corpus Christi.
- **Gulf of Mexico, Segment 2501**
  - The Gulf of Mexico is a known fishery and is identified as an exceptional quality aquatic habitat.

Endangered and Threatened Species

- Brown Pelican
- Reddish Egret
- Kemp's Ridley Sea Turtle
- Green Sea Turtle

Site History

- The Falcon Refinery site consists of an abandoned refinery that had operated intermittently since 1980. When in operation, the refinery operated at a capacity of 40,000 barrels per day with primary products consisting of naptha, jet fuel, kerosene, diesel, and fuel oil. The refinery processed material that consisted not only of crude oil, but also hazardous substances.



TANK #	SIZE	TOTAL CAPACITY	NOTES
1	1,000	-	GAS, DIESEL OILS, 69 % FUEL
2	1,000	-	PH > 12.5 LIGHT OIL
3	-	-	UNKNOWN
4	-	-	2' PARAFFIN BASED OIL SLUDGE
5	-	-	EMPTY
6	-	-	3' PARAFFIN BASED OIL SLUDGE
7	10,000	10,000	HAZ. LEAD
8	20,000	-	EMPTY - 97 % WATER
9	20,000	-	EMPTY
10	50,000	50,000	NO ANALYSES
11	50,000	50,000	NO ANALYSES
12	100,000	-	LEASED FOR CRUDE STORAGE
13	100,000	-	LEASED FOR CRUDE STORAGE
14	100,000	-	LEASED FOR CRUDE STORAGE
15	55,000	-	EMPTY
16	55,000	-	LEASED FOR CRUDE STORAGE
17	5,000	5,000	HAZ. BENZENE
18	5,000	5,000	MOSTLY WATER / MAY NOT BE
19	5,000	5,000	NOT ANALYZED
20	5,000	5,000	PH > 12.5 CAUSTIC AND GASOLINE
21	5,000	5,000	87 % WATER
22	5,000	5,000	MAY NOT BE
23	5,000	5,000	97 % WATER AND GASOLINE
24	5,000	5,000	MOSTLY WATER
25		-	UNKNOWN
26	65,000	65,000	75 % - GAS, DIESEL, LEAD AND ZINC
27	65,000	65,000	MOSTLY WATER
28	67,000	-	EMPTY
29	67,000	-	HAS BEEN REMOVED
30	200,000	-	EMPTY
31	67,000	-	HAS BEEN REMOVED
		280,000 BARRELS 11,760,000 GALLONS	

In May 2000, the Texas Natural Resource Conservation Commission conducted sampling activities at the site and documented the following hazardous substances:

- cyclohexane
- methylcyclohexane
- toluene
- ethylbenzene
- xylenes (totals)
- fluoranthene
- pyrene
- benzo(a)anthracene
- chrysene
- benzo(b)fluoranthene
- benzo(k)fluoranthene
- benzo(a)pyrene
- ideno(1,2,3-cd)pyrene
- benzo(g,h,i)perylene
- aluminum
- arsenic
- barium
- cadmium
- chromium
- copper
- lead
- manganese
- mercury
- nickel
- selenium
- thallium
- vanadium
- zinc

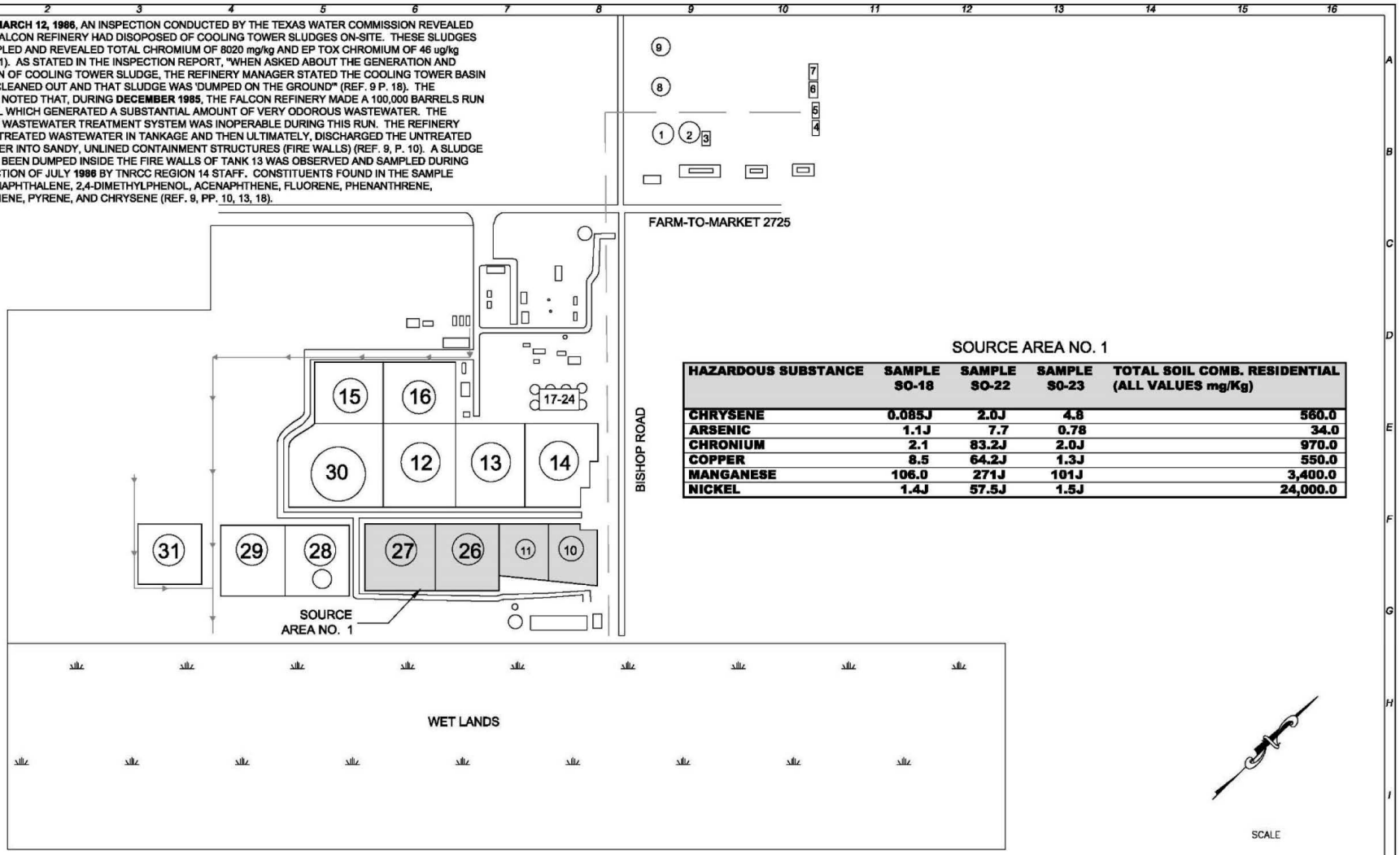
The findings of an expanded site inspection, completed in November 2000, revealed releases from the site of the following hazardous substances:

- fluoranthene
- pyrene
- benzo(a)anthracene
- chrysene
- benzo(b)fluoroanthene
- benzo(k)fluoroanthene
- benzo(a)pyrene
- ideno(1,2,3-cd)pyrene
- benzo(g,h,i)perylene
- dibenz(a,h)anthracene
- barium
- manganese
- mercury

The media affected are sediments in the Redfish Bay fishery and contiguous wetlands and on-site soils. The following hazardous substances were documented in sediments obtained in Redfish Bay and nearby wetlands at elevated concentrations that require further investigation:

- fluoranthene
- pyrene
- benzo(a)anthracene
- chrysene
- benzo(b)fluoranthene
- benzo(k)fluoroanthene
- benzo(a)pyrene
- ideno(1,2,3-cd)pyrene
- benzo(g,h,i)perylene
- barium
- manganese
- mercury

NOTE: ON **MARCH 12, 1986**, AN INSPECTION CONDUCTED BY THE TEXAS WATER COMMISSION REVEALED THAT THE FALCON REFINERY HAD DISOPOSED OF COOLING TOWER SLUDGES ON-SITE. THESE SLUDGES WERE SAMPLED AND REVEALED TOTAL CHROMIUM OF 8020 mg/kg AND EP TOX CHROMIUM OF 46 ug/kg (REF. 9, P. 11). AS STATED IN THE INSPECTION REPORT, "WHEN ASKED ABOUT THE GENERATION AND DISPOSITION OF COOLING TOWER SLUDGE, THE REFINERY MANAGER STATED THE COOLING TOWER BASIN HAD BEEN CLEANED OUT AND THAT SLUDGE WAS 'DUMPED ON THE GROUND'" (REF. 9 P. 18). THE INSPECTOR NOTED THAT, DURING **DECEMBER 1985**, THE FALCON REFINERY MADE A 100,000 BARRELS RUN OF SLOP OIL WHICH GENERATED A SUBSTANTIAL AMOUNT OF VERY ODOROUS WASTEWATER. THE REFINERY'S WASTEWATER TREATMENT SYSTEM WAS INOPERABLE DURING THIS RUN. THE REFINERY PLACED UNTREATED WASTEWATER IN TANKAGE AND THEN ULTIMATELY, DISCHARGED THE UNTREATED WASTEWATER INTO SANDY, UNLINED CONTAINMENT STRUCTURES (FIRE WALLS) (REF. 9, P. 10). A SLUDGE WHICH HAD BEEN DUMPED INSIDE THE FIRE WALLS OF TANK 13 WAS OBSERVED AND SAMPLED DURING THE INSPECTION OF JULY **1986** BY TNRCC REGION 14 STAFF. CONSTITUENTS FOUND IN THE SAMPLE INCLUDED NAPHTHALENE, 2,4-DIMETHYLPHENOL, ACENAPHTHENE, FLUORENE, PHENANTHRENE, FLUORANTHENE, PYRENE, AND CHRYSENE (REF. 9, PP. 10, 13, 18).



SOURCE AREA NO. 1

HAZARDOUS SUBSTANCE	SAMPLE SO-18	SAMPLE SO-22	SAMPLE SO-23	TOTAL SOIL COMB. RESIDENTIAL (ALL VALUES mg/Kg)
CHRYSENE	0.085J	2.0J	4.8	560.0
ARSENIC	1.1J	7.7	0.78	34.0
CHRONIUM	2.1	83.2J	2.0J	970.0
COPPER	8.5	64.2J	1.3J	550.0
MANGANESE	106.0	271J	101J	3,400.0
NICKEL	1.4J	57.5J	1.5J	24,000.0

SCALE

N.T.S.

NO.	REVISIONS	DATE

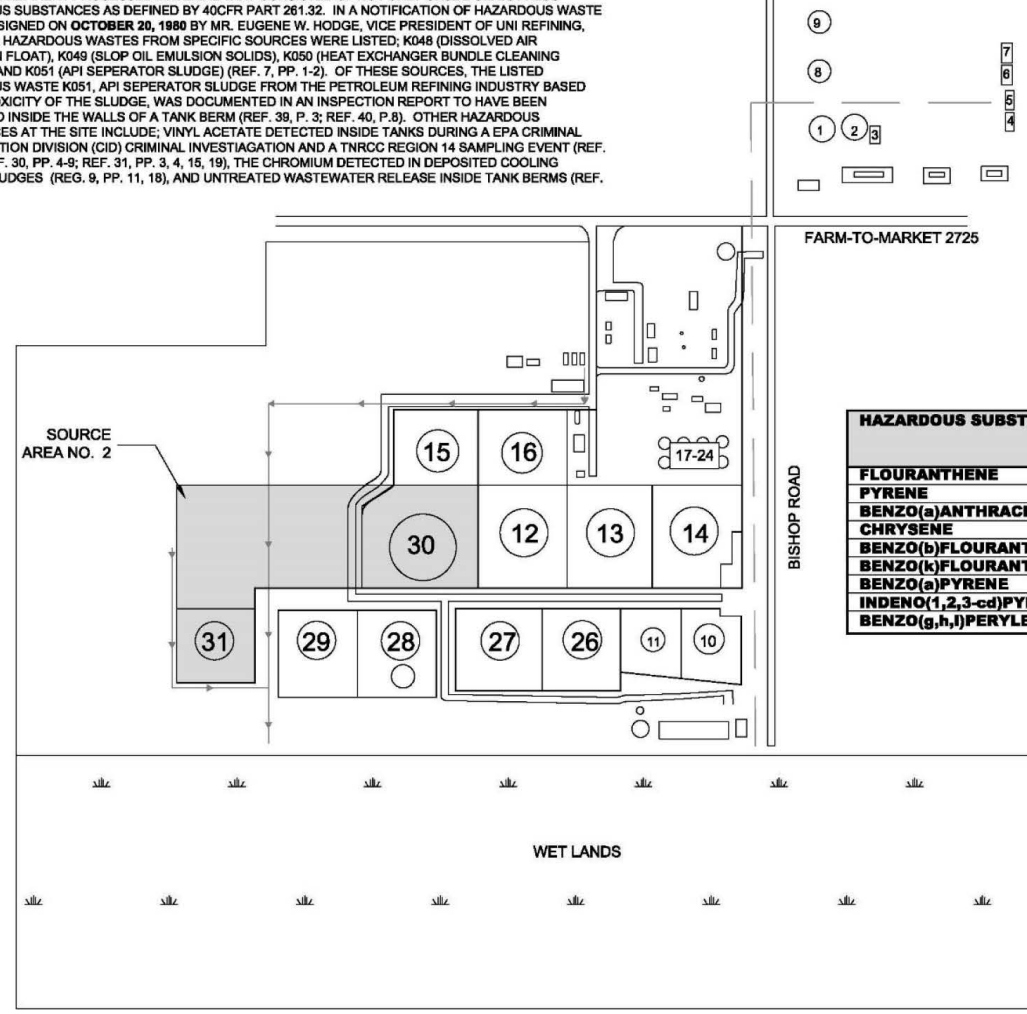
BNC ENGINEERING, LLC
607 RIVER BEND DRIVE
GEORGETOWN, TX 78628

FALCON REFINING

SITE MAP

JOB NO.	SCALE	DATE	DRAWING NO.
	N.T.S.	09/19/03	

NOTE: THE REFINERY PROCESSED MATERIAL THAT CONSISTED OF NOT ONLY CRUDE OIL BUT ALSO HAZARDOUS SUBSTANCES AS DEFINED BY 40CFR PART 261.32. IN A NOTIFICATION OF HAZARDOUS WASTE ACTIVITY, SIGNED ON **OCTOBER 20, 1980** BY MR. EUGENE W. HODGE, VICE PRESIDENT OF UNI REFINING, INC., FOUR HAZARDOUS WASTES FROM SPECIFIC SOURCES WERE LISTED; K048 (DISSOLVED AIR FLOTATION FLOAT), K049 (SLOP OIL EMULSION SOLIDS), K050 (HEAT EXCHANGER BUNDLE CLEANING SLUDGE), AND K051 (API SEPERATOR SLUDGE) (REF. 7, PP. 1-2). OF THESE SOURCES, THE LISTED HAZARDOUS WASTE K051, API SEPERATOR SLUDGE FROM THE PETROLEUM REFINING INDUSTRY BASED ON THE TOXICITY OF THE SLUDGE, WAS DOCUMENTED IN AN INSPECTION REPORT TO HAVE BEEN DEPOSITED INSIDE THE WALLS OF A TANK BERM (REF. 39, P. 3; REF. 40, P.8). OTHER HAZARDOUS SUBSTANCES AT THE SITE INCLUDE; VINYL ACETATE DETECTED INSIDE TANKS DURING A EPA CRIMINAL INVESTIGATION DIVISION (CID) CRIMINAL INVESTIAGATION AND A TNRCC REGION 14 SAMPLING EVENT (REF. 27, P.1; REF. 30, PP. 4-9; REF. 31, PP. 3, 4, 15, 19), THE CHROMIUM DETECTED IN DEPOSITED COOLING TOWER SLUDGES (REG. 9, PP. 11, 18), AND UNTREATED WASTEWATER RELEASE INSIDE TANK BERMS (REF. 9, P. 10).



SOURCE AREA NO. 2

HAZARDOUS SUBSTANCE	SAMPLE SO-26	TOTAL SOIL COMB. RESIDENTIAL (ALL VALUES mg/Kg)
FLOURANTHENE	0.470	2,300.0
PYRENE	0.490	1,700.0
BENZO(a)ANTHRACENE	0.370	5.70
CHRYSENE	0.580	5.60
BENZO(b)FLOURANTHENE	0.990	5.70
BENZO(k)FLOURANTHENE	0.600	5.00
BENZO(a)PYRENE	0.740	0.56
INDENO(1,2,3-cd)PYRENE	0.560	1,800.0
BENZO(g,h,I)PERYLENE	0.610	1,800.0

SCALE

N.T.S.

NO.	REVISIONS	DATE

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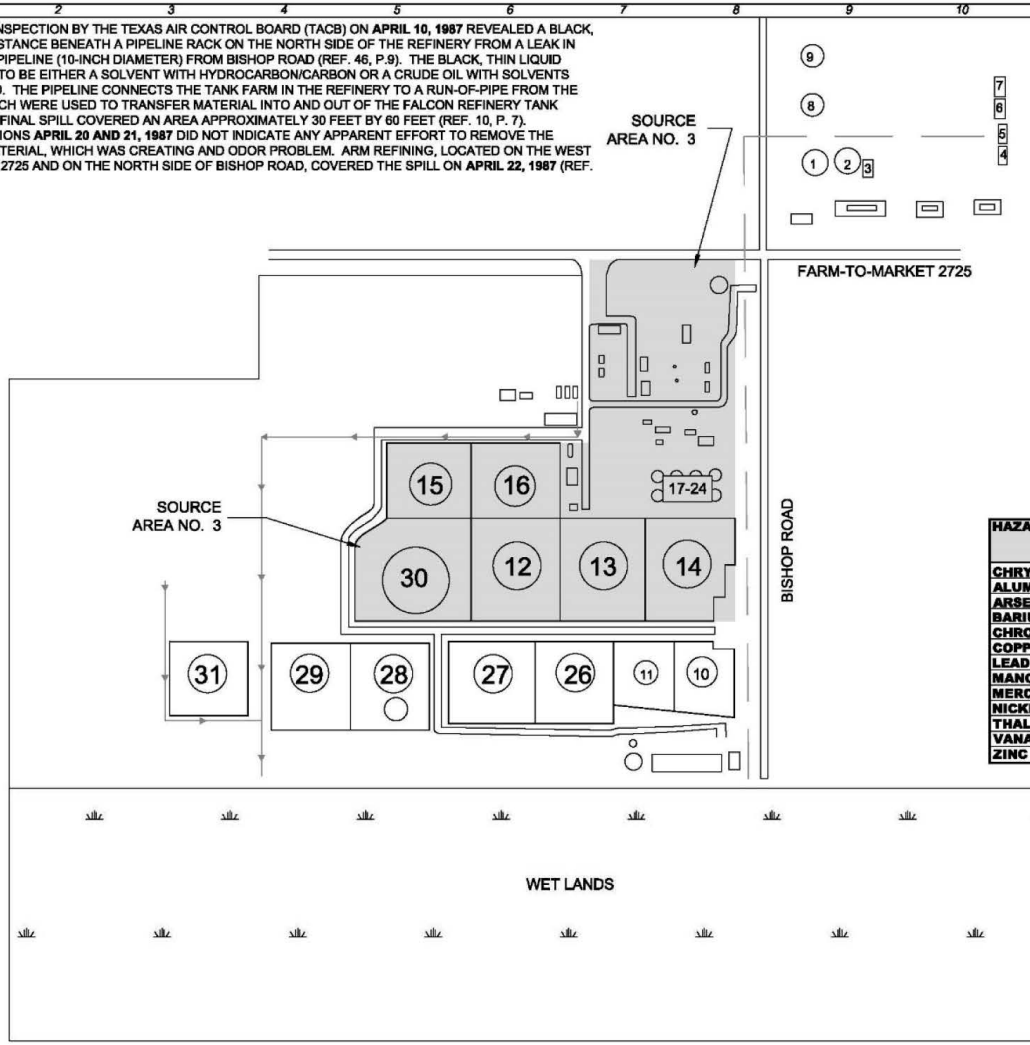
GEORGETOWN, TX 78628

FALCON REFINING

SITE MAP

JOB NO.	SCALE	DATE	DRAWING NO.
	N.T.S.	09/19/03	

NOTE: AN INSPECTION BY THE TEXAS AIR CONTROL BOARD (TACB) ON **APRIL 10, 1987** REVEALED A BLACK, LIQUID SUBSTANCE BENEATH A PIPELINE RACK ON THE NORTH SIDE OF THE REFINERY FROM A LEAK IN THE THIRD PIPELINE (10-INCH DIAMETER) FROM BISHOP ROAD (REF. 46, P.9). THE BLACK, THIN LIQUID APPEARED TO BE EITHER A SOLVENT WITH HYDROCARBON/CARBON OR A CRUDE OIL WITH SOLVENTS INTERMIXED. THE PIPELINE CONNECTS THE TANK FARM IN THE REFINERY TO A RUN-OF-PIPE FROM THE DOCKS WHICH WERE USED TO TRANSFER MATERIAL INTO AND OUT OF THE FALCON REFINERY TANK FARM. THE FINAL SPILL COVERED AN AREA APPROXIMATELY 30 FEET BY 60 FEET (REF. 10, P. 7). INVESTIGATIONS **APRIL 20 AND 21, 1987** DID NOT INDICATE ANY APPARENT EFFORT TO REMOVE THE SPILLED MATERIAL, WHICH WAS CREATING AND ODOR PROBLEM. ARM REFINING, LOCATED ON THE WEST SIDE OF FM 2725 AND ON THE NORTH SIDE OF BISHOP ROAD, COVERED THE SPILL ON **APRIL 22, 1987** (REF. 46, P. 1).



SOURCE AREA NO. 3

HAZARDOUS SUBSTANCE	SO-11	SO-12	SO-13	SO-14	TOTAL SOIL COMB. RESIDENTIAL (ALL VALUES mg/ Kg)
CHRYSENE	47J	ND	N/A	ND	560.0
ALUMINUM	6,050	1,630	796	2,470	65,000
ARSENIC	1.0J	2.6J	ND	0.86J	34.0
BARIUM	129	1,040	47.0	68.7	2,800
CHROMIUM	8.5	23.2	2.2	2.8	970
COPPER	5.8	49.7	3.8	1.9	550
LEAD	60.4	200	220	28.6	500
MANGANESE	145	59.5	43.4	101	3,400
MERCURY	0.072	0.18	0.08	ND	2.1
NICKEL	3.5	7.9	0.72	1.6J	24,000
THALLIUM	ND	0.74	ND	ND	6.3
VANADIUM	9.0	15.7	2.1	4.8	290
ZINC	99.5	291	156	13.6	9,9000

SOURCE AREA NO. 3

HAZARDOUS SUBSTANCE	SO-16	SO-17	SO-30	SO-33	TOTAL SOIL COMB. RESIDENTIAL (ALL VALUES mg/ Kg)
CHRYSENE	ND	ND	ND	2.5	560.0
ALUMINUM	1,810	1.5J	1.8	5.6	65,000
ARSENIC	4.9J	1.5J	1.8	5.6	34.0
BARIUM	149	138	136	47.2	2,800
CHROMIUM	31.5	4.6	5.0	28.6	970
COPPER	30.6	5.2	5.0	50.2	550
LEAD	124	18.6	9.2	31.3	500
MANGANESE	735	185	222	139	3,400
MERCURY	0.096	0.065	0.07	0.06	2.1
NICKEL	42.7	2.8	3.7	14.1	24,000
THALLIUM	5.9	ND	ND	8.8	6.3
VANADIUM	6.5	7.0	8.6	5.6	290
ZINC	44.4	38.2	42.8	43.9	9,9000

SOURCE AREA NO. 3

HAZARDOUS SUBSTANCE	SO-02	DUP	SO-09	SO-10	TOTAL SOIL COMB. RESIDENTIAL (ALL VALUES mg/ Kg)
CHRYSENE	N/A	N/A	N/A	ND	560.0
ALUMINUM	448	461	645	2150	65,000
ARSENIC	ND	ND	ND	0.81J	34.0
BARIUM	31.0	28.7	35.2	176	2,800
CHROMIUM	1.7	1.6	1.7	2.8	970
COPPER	1.4J	1.3	1.7	2.4	550
LEAD	204	185	89.5	11.3	500
MANGANESE	17.1	15.9	26.7	124	3,400
MERCURY	0.064	0.058	0.054	ND	2.1
NICKEL	0.33	0.16	0.24	1.8	24,000
THALLIUM	ND	ND	ND	ND	6.3
VANADIUM	0.88	0.88	1.3	5.5	290
ZINC	165	156	19.2	12.7	9,9000

SCALE

N.T.S.

NO.	REVISIONS	DATE

BNC ENGINEERING, LLC
607 RIVER BEND DRIVE
GEORGETOWN, TX 78628

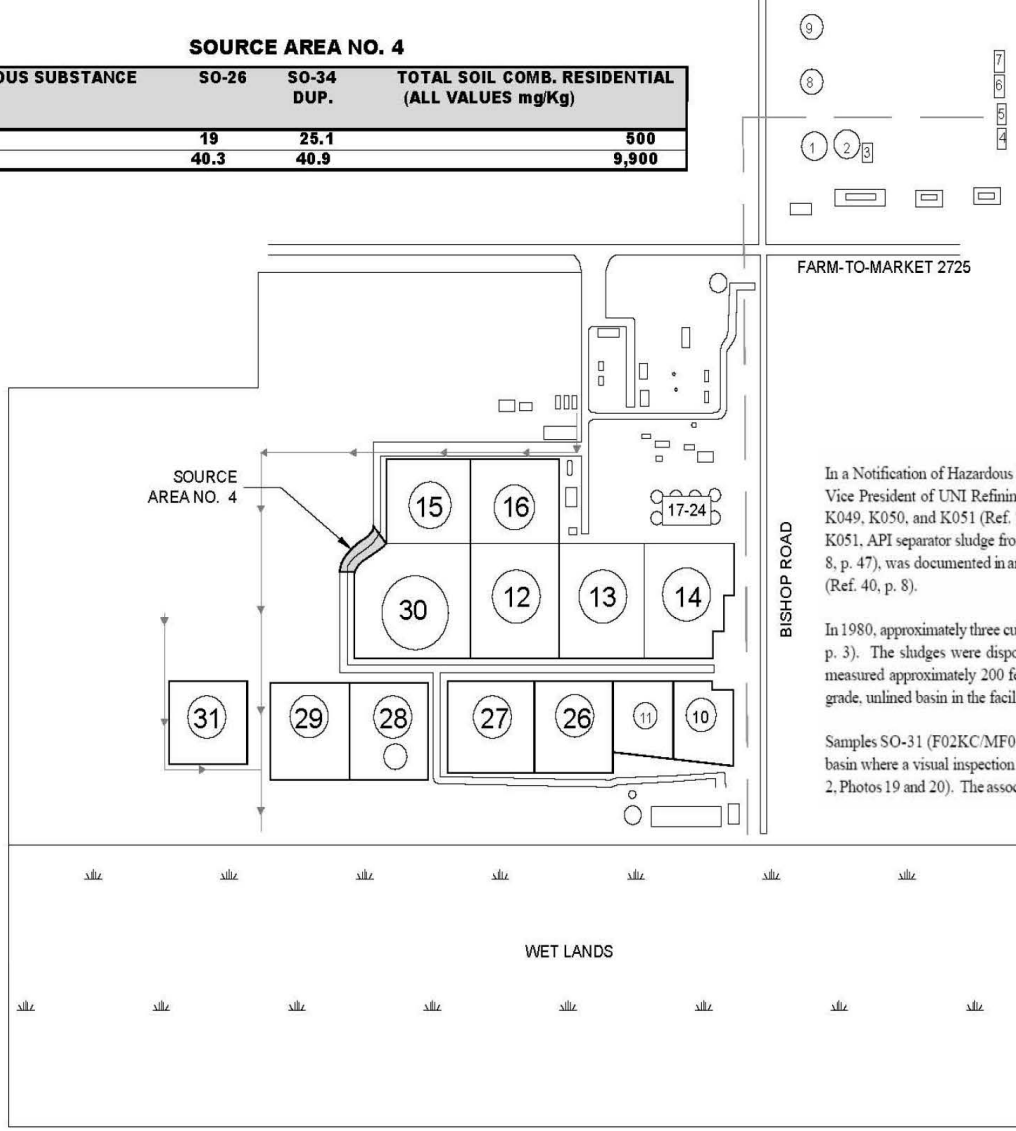
FALCON REFINING

SITE MAP

JOB NO.	SCALE	DATE	DRAWING NO.
	N.T.S.	09/19/03	

SOURCE AREA NO. 4

HAZARDOUS SUBSTANCE	SO-26	SO-34 DUP.	TOTAL SOIL COMB. RESIDENTIAL (ALL VALUES mg/Kg)
LEAD	19	25.1	500
ZINC	40.3	40.9	9,900



In a Notification of Hazardous Waste Activity, signed on October 20, 1980 by Mr. Eugene W. Hodge, Vice President of UNI Refining, Inc., four hazardous waste from specific sources were listed: K048, K049, K050, and K051 (Ref. 7, pp. 1-2; Ref. 41, p. 11). Of these sources, the listed hazardous waste K051, API separator sludge from the petroleum refining industry based on the toxicity of the sludge (Ref. 8, p. 47), was documented in an inspection report to have been deposited inside the walls of a tank berm (Ref. 40, p. 8).

In 1980, approximately three cubic yards of API separator sludges were spread onto the ground (Ref. 39, p. 3). The sludges were disposed of by UNI Refining, Inc., within the fire walls of Tank 30, which measured approximately 200 feet by 200 feet. The disposal area was designated as an earthen, above-grade, unlined basin in the facility's permit application (Ref. 41, pp. 11, 13).

Samples SO-31 (F02KC/MF00PX) and SO-34 (F02KF/MF00Q0) were taken within the land treatment basin where a visual inspection revealed a dark substance in the soil (Tables 16-17; Ref. 13, p. 26, Roll 2, Photos 19 and 20). The associated information on background soil samples is available in Tables 18-19.

SCALE

N.T.S.

NO.	REVISIONS	DATE

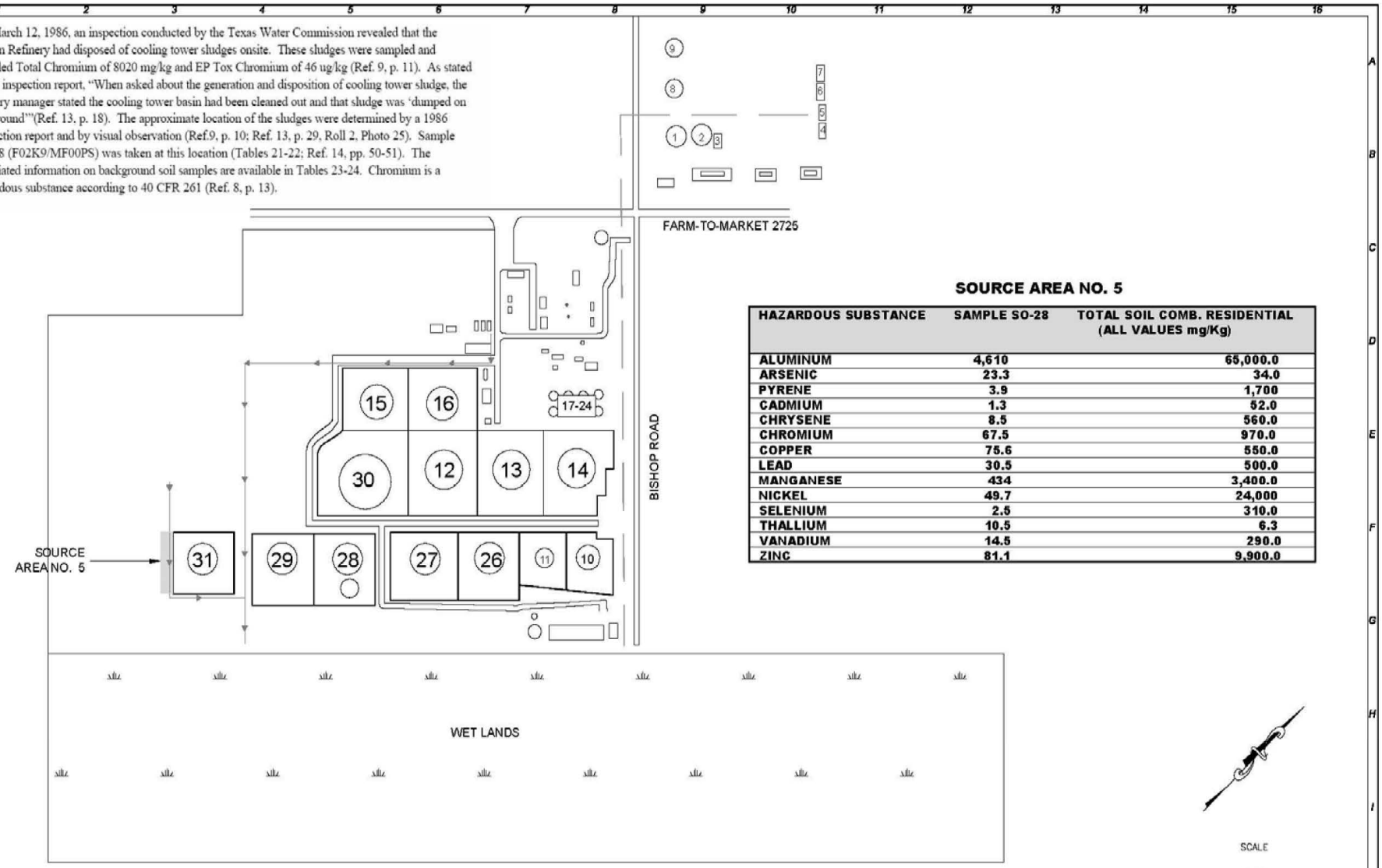
BNC ENGINEERING, LLC
807 RIVER BEND DRIVE
GEORGETOWN, TX 78628

FALCON REFINING

SITE MAP

JOB NO.	SCALE	DATE	DRAWING NO.
	N.T.S.	09/16/03	

On March 12, 1986, an inspection conducted by the Texas Water Commission revealed that the Falcon Refinery had disposed of cooling tower sludges onsite. These sludges were sampled and revealed Total Chromium of 8020 mg/kg and EP Tox Chromium of 46 ug/kg (Ref. 9, p. 11). As stated in the inspection report, "When asked about the generation and disposition of cooling tower sludge, the refinery manager stated the cooling tower basin had been cleaned out and that sludge was 'dumped on the ground'"(Ref. 13, p. 18). The approximate location of the sludges were determined by a 1986 inspection report and by visual observation (Ref.9, p. 10; Ref. 13, p. 29, Roll 2, Photo 25). Sample SO-28 (F02K9/MF00PS) was taken at this location (Tables 21-22; Ref. 14, pp. 50-51). The associated information on background soil samples are available in Tables 23-24. Chromium is a hazardous substance according to 40 CFR 261 (Ref. 8, p. 13).



SOURCE AREA NO. 5

HAZARDOUS SUBSTANCE	SAMPLE SO-28	TOTAL SOIL COMB. RESIDENTIAL (ALL VALUES mg/Kg)
ALUMINUM	4,610	65,000.0
ARSENIC	23.3	34.0
PYRENE	3.9	1,700
CADMIUM	1.3	52.0
CHRYSENE	8.5	560.0
CHROMIUM	67.5	970.0
COPPER	75.6	550.0
LEAD	30.5	500.0
MANGANESE	434	3,400.0
NICKEL	49.7	24,000
SELENIUM	2.5	310.0
THALLIUM	10.5	6.3
VANADIUM	14.5	290.0
ZINC	81.1	9,900.0

SCALE

N.T.S.

NO.	REVISIONS	DATE

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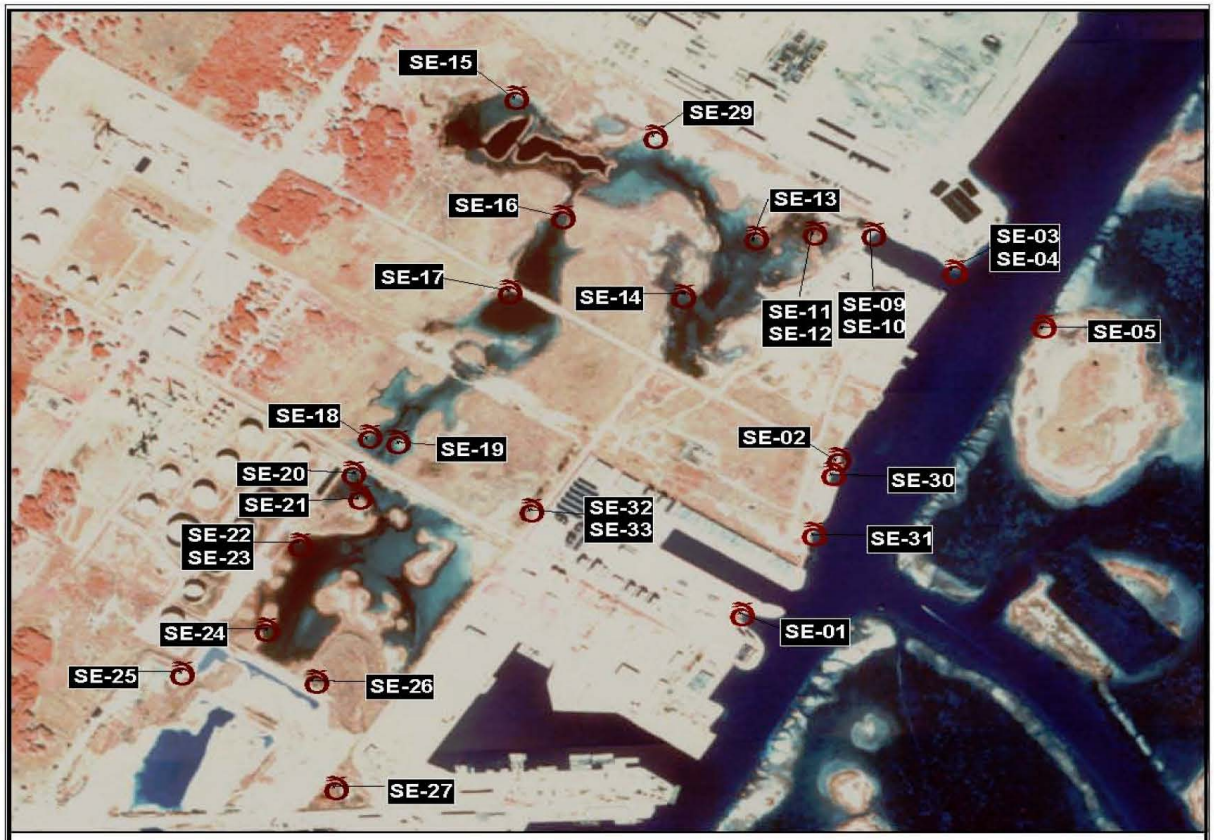
FALCON REFINING

SITE MAP

JOB NO.	SCALE	DATE	DRAWING NO.
	N.T.S.	09/19/03	

Sediment Sampling

- During May 2000 the TCEQ evaluated the surface water pathway by sampling sediment at 33 locations.
- The locations included four background locations to evaluate observed releases for samples SE-30, SE-31, SE-14, SE-20, SE-21 and SE-27.
- Observed releases are based on detection on compounds above lab method quatitation limit.



0.4 0 0.4 Miles

N

Figure 6
Surface Water Pathway Overland Flow:
Sediment Samples

Falcon Refinery aka National Oil Recovery Corporation
Ingleside, San Patricio County, Texas
TXD 086 278 058

Legend

Sediment Samples

Protecting Texas by Reducing and Preventing Pollution

TNRCC

Source

The base data used is the Port Ingleside NE Digital Orthoquarter Quad (DOQQ), which is a digital version of an aerial photograph. This DOQQ was produced by the TNRCC using USGS guidelines. UTM NAD83 Zone 14

Sediment Sample Analysis

- Table 1 provides the results from the HRS of the contaminated sediment samples.

- Results indicated that only one constituent at single location exceeded the TCEQ protective concentration limits (PCL) for total soil combined residential values.

Sediment Sample Analysis

- The lone constituent that exceeded the PCL was Benzo(a)pyrene.
- The sample was taken at location SE-30.
- SE-30 is a significant distance away from the refinery and an adjacent sample SE-02 did not have any detection of Benzo(a)pyrene.
- Additional industries have had releases in the area.

Other Potential Sources

- Plains marketing, adjacent to the northern portion of the refinery, has had a documented spill, which caused pollution to surface water. They have a docking facility.
- Garrett Construction, located south of the site has an abrasive sand blasting operation.
- Aker Gulf Marine, fabricator of offshore structures and petroleum related structures, has a TPDES permit.

Other Potential Sources

- IBC Petroleum and Pi Energy are located immediately adjacent to the docking facility. Soil samples were taken beneath leaking equipment.
- Brown and Root, located near the docking facility, had a leaking UST and soil contamination.
- Ingleside Properties aka Dugat Docks is a oilfield waste treatment plant.

Other Potential Sources

- Gulf Coast Conservation is located north of the NORCO dock and south of Aker Marine. During December 1995 a spill occurred of approximately 170 gallons of unknown petroleum hydrocarbons.

Risks Posed

- Human health and ecological risk assessments are an integral part of the remedial investigation and feasibility study currently being planned for the site.

- A human health risk assessment estimates the current and possible future risks if no action was taken to clean up a site. Risk assessors determine how threatening a hazardous waste site is to human health and the environment. Living near a Superfund site doesn't automatically place a person at risk, that depends on the chemicals present and the ways people are exposed to them.

Risks Posed (cont.)

- An ecological risk assessment is defined as a process that evaluates the likelihood that adverse ecological effects are occurring or may occur as a result of exposure to one or more stressors. A stressor is any physical, chemical, or biological entity that can induce an adverse ecological response. Adverse responses can range from sub-lethal chronic effects in individual organisms to a loss of ecosystem function. Only chemical or physical stressors are subject to risk management decisions at Superfund sites.
- Human health and ecological risk assessments will be performed during the remedial investigation and feasibility study currently being planned for the site.

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